



MONTHLY NOTICES

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No. 8

H. F. NEWALL, Esq., M.A., F.R.S., PRESIDENT, in the Chair.

Hugh Cameron Campbell, Science Department, Surgeons' Hall,
Edinburgh,
and

The Rev. Arthur Mackreth Deane, M.A., Canon of Chichester,
Ferring Vicarage, Worthing, Sussex,

were balloted for and duly elected Fellows of the Society.

Benjamin Baillaud, Director of the Observatory, Paris ;

Carl Ludwig Wilhelm Charlier, Director of the Observatory,
Lund, Sweden ;

Edwin Brant Frost, Director of the Yerkes Observatory,
Williams Bay, Wisconsin, U.S.A. ;

Johann Georg Hagen, S.J., Director of the Vatican Observatory,
Rome ; and

Johannes Franz Hartmann, Astrophysical Observatory, Potsdam,
Germany,

were balloted for and duly elected Associates of the Society.

The following candidate was proposed for election as a Fellow of the Society, the name of the proposer from personal knowledge being appended :—

The Rev. Thomas Nicklin, M.A., Assistant Master, Rossall School, Bescot, Rossall Beach, Fleetwood, Lancashire (proposed by S. A. Saunder).

Eighty-one presents were announced as having been received since the last meeting, including amongst others :—Cape Catalogue of 1680 stars for equinox 1900'0, presented by the Royal Observa-

tory, Cape of Good Hope; G. E. Hale, The Study of Stellar Evolution, presented by the author; five spectroheliographs (enlargements), showing hydrogen and calcium flocculi, presented by the Mount Wilson Observatory; lithograph from a drawing of Donati's Comet, by Miss Charlotte S. Cooper, Markree, presented by Miss Cooper; 16 charts of the Astrographic Chart of the heavens, presented by the Royal Observatory, Greenwich.

Considerations on the Form and Arrangement of New Tables of the Moon. By Simon Newcomb.

Hansen's Tables of the Moon, with some patching up, have now been in use in the standard astronomical ephemerides for a full half century. With every passing year the necessity of replacing them by improved ones becomes more urgent. My own investigations on the Moon's motion have always been carried on with the view of ultimately constructing new tables, while experience in the use of Hansen's tables has from time to time formed a basis for a study of the relative merits of various forms of the lunar theory for the purpose of tabulation. But, as the years have passed, it has become increasingly apparent that I must leave to other hands the execution of the desired work. I therefore venture to summarise the suggestions which I have to make on the whole subject.

§ 1. *General Form of Tables.*

All my experience with Hansen's tables has led me to the conclusion that if the problem were only that of enabling an ephemeris of the Moon to be computed with the use of the fewest figures, it would scarcely be possible to improve on Hansen's arguments and system of tabulation. The Hansenian perturbations of the mean anomaly are more rapidly convergent than those of any co-ordinate that can be used, and therefore require fewest tables. The expression of the fundamental argument in terms of the time may also have a certain advantage, though this is a point on which I feel less confident, because the best unit is not a decimal of a day.

But the mental labour to be performed is not measured merely by the number of figures taken out and written down. A "straight-ahead" computation has a decided advantage over one in which it is necessary to form numbers from preceding tables, or to introduce tables of logarithms, as we must when we pass from Hansen's fundamental argument to the true longitude. This remark is especially applicable to the reduction to the ecliptic. The mental labour of forming arguments from numbers already used and of combining results from various tables is intensified by the care and attention which then have to be bestowed, and which it is desirable to render unnecessary.